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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/068,523

02/05/2002

Eng C. Cheah

9818-066-999

9901

20583

7590

05/25/2004

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EXAMINER

WILLIAMS, ALEXANDER O

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 05/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/068,523

Applicant(s)

CHEAH ET AL.

Examiner

Alexander O Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2004 and 12 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 6-22 is/are pending in the application.
- 4a) Of the above claim(s) 12-22 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-11 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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Serial Number: 10/068523 Attorney's Docket #: 9818-066-999

Filing Date: 2/5/02;

Applicant: Cheah et al.

Examiner: Alexander Williams

Applicant's Responses, filed 1/27/04 and 3/9/04, has been acknowledged.

Claims 2-5 have been canceled.

This application contains claims 12 to 22 drawn to an invention non-elected with traverse in Paper No. 7. A complete response to the final rejection must include cancellation of non-elected claims or other appropriate action (see 37 CFR § 1.144 & MPEP § 821.01).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipating by Deeney (U.S. Patent Applicant Publication # 2003/0020160 A1).

For example, in claim 1, Deeney (figures 1 to 10) specifically **figure 1** show a ball grid array package **10** comprising: a substrate **14** having a first and second sides; an integrated circuit device **12** attached to said first side of said substrate; a metal cap **40** having a side wall portion and a top portion forming an internal cavity, wherein said

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metal cap is attached to said first side of said substrate along a peripheral portion of said first side so that said integrated circuit device is within said internal cavity; and an epoxy encapsulant material **46,32** filling a substantial portion of said internal cavity, and said epoxy encapsulant material being in contact with both said integrated circuit device and said top portion of said metal cap, wherein said metal cap is constructed from a material selected from aluminum.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

**Initially, it is noted that the 35 U.S.C. § 103 rejection based on a cap, heat sink and a strengthening ring deals with an issue (i.e., the integration of multiple pieces into one piece or conversely, using multiple pieces in replacing a single piece) that has been previously decided by th courts.**

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In Howard v. Detroit Stove Works 150 U.S. 164 (1893), the Court held, "it involves no invention to cast in one piece an article which has formerly been cast in two pieces and put together...."

In In re Larson 144 USPQ 347 (CCPA 1965), the term "integral" did not define over a multi-piece structure secured as a single unit. More importantly, the court went further and stated, "we are inclined to agree with the solicitor that the use of a one-piece construction instead of the [multi-piece] structure disclosed in Tuttle et al. would be merely a matter of obvious engineering choice" (bracketed material added). The court cited In re Fridolph for support.

In re Fridolph 135 USPQ 319 (CCPA 1962) deals with submitted affidavits relating to this issue. The underlying issue in In re Fridolph was related to the end result of making a multi-piece structure into a one-piece structure. Generally, favorable patentable weight was accorded if the one-piece structure yielded results not expected from the modification of the two-piece structure into a single piece structure.

Claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Tao (U.S. Patent # 6,410,981 B2).

For example, in claim 1, Tao (figures 1 to 8) specifically **figure 1** show a ball grid array package comprising: a substrate **5** having a first and second sides; an integrated circuit device **4** attached to said first side of said substrate; a metal cap **1,2**, having a side wall portion and a top portion forming an internal cavity, wherein said metal cap is attached to said first side of said substrate along a peripheral portion of said first side so that said integrated circuit device is within said internal cavity; and an epoxy encapsulant material **7** filling a substantial portion of said internal cavity, and said epoxy encapsulant material being in contact with both said integrated circuit device and said top portion of said metal cap, wherein said metal cap is constructed from a material from copper (see column 5, lines 4-10).

Therefore, it would have been obvious to one of ordinary skill in the art to use the cap, heat sink and the strengthening

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ring as "merely a matter of obvious engineering choice" as set forth in the above case law.

Claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Terachi et al. (Japan Patent # 1-191456) in view of Tao (U.S. Patent # 6,410,981 B2).

For example, in claim 1, Terachi et al. (figures 1 to 6) specifically **figure 4** show a pin grid array package comprising: a substrate **21** having a first and second sides; an integrated circuit device **22** attached to said first side of said substrate; a metal cap **11A** having a side wall portion and a top portion forming an internal cavity, wherein said metal cap is attached to said first side of said substrate along a peripheral portion of said first side so that said integrated circuit device is within said internal cavity; and an epoxy encapsulant material **24,25** filling a substantial portion of said internal cavity, and said epoxy encapsulant material being in contact with both said integrated circuit device and said top portion of said metal cap. Terachi et al. fails to show a ball grid array package.

Tao et al. is cited for a vented semiconductor device package. Specifically, Teo et al. (figures 1 to 8) specifically **figure 1** show a ball grid array package for the purpose of providing a packaged semiconductor device having high reliability which can solve problems caused by the loading of a large number of pins, that is, density of the electrical wiring become high, and the decreased heat loss properties thereof, and which can discharge the high pressure moisture in a gas state from the inside thereof of the exterior.

Therefore, it would have been obvious to one of ordinary skill in the art to use the teaching of Tao et al.'s ball grid array package to modify Terachi et al.'s pin grid array package for the purpose of providing a packaged semiconductor device having high reliability which can solve problems caused by the loading of a large number of pins, that is, density of the electrical wiring become high, and the decreased heat loss properties thereof, and which can discharge the high pressure moisture in a gas state from the inside thereof of the exterior.

Claims 6 to 11 are allowable over the prior art of record.

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## Response

Applicant's arguments filed 1/27/04 and 3/9/04 have been fully considered, but are moot in view of the new grounds of rejections detailed above.

The listed references are cited as of interest to this application, but not applied at this time.

Field of Search	Date
U.S. Class and subclass: 257/704,710,712,713,675,784,786- 795,737,738,734,667,668,680,774,778,780	8/7/02 2/22/03 9/18/03 5/20/04
Other Documentation: foreign patents and literature in 257/704,710,712,713,675,784,786- 795,737,738,734,667,668,680,774,778,780	8/7/02 2/22/03 9/18/03 5/20/04
Electronic data base(s): U.S. Patents EAST	8/7/02 2/22/03 9/18/03 5/20/04

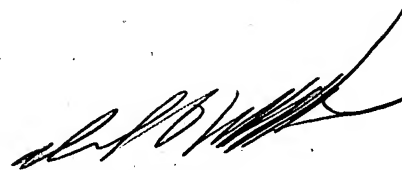
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272 1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AOW  
5/21/04



Primary Examiner  
Alexander O. Williams